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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,412	08/23/2001	Wan-Thai Hsu	UOM 0211 PUSP	9985

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EXAMINER

KWOK, HELEN C

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 05/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/938,412

Applicant(s)  
Hsu et al.

Examiner  
H. Kwok

Art Unit  
2856



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Mar 20, 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4, 6-18 and 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Publication titled "Geometric Stress Compensation for Enhanced Thermal Stability in Micromechanical Resonators" (Hsu et al.).

With regards to claims 1-2, 4, 6-18, Hsu et al. discloses a micromechanical resonator comprising a semiconductor substrate, a single lateral flexural-mode resonator (the middle portion of the device, usually referred as the shuttle mass) made of polysilicon includes first and second ends; a temperature-compensating support structure (the inner and outer pair of folded beams with a truss support beam connecting the inner and outer pair of folded beams) is anchored by anchor lip to the substrate to support the resonator at the first and second ends above the substrate wherein the support structure includes a first support member (the inner pair of folded beams) and a second support member (the outer pair of folded beams and the truss support beam) for coupling the first support member to the resonator such that the first support member and the resonator have different effective lengths (See page 946, paragraph starting with "As

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shown, this device ..."); a drive electrode structure and a sense electrode structure made of plated metal are formed on the substrate . (As observed in Figures 2-4; pages 945-948, section I to IV).

With regards to claims 20-23, the claims are commensurate in scope with the above claims and are rejected for the same reasons as set forth above. Furthermore, the frequency versus temperature curve have peaks and valley and increases in dependance of the resonator. (See, Figures 1 and 9).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 5, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Publication titled "Geometric Stress Compensation for Enhanced Thermal Stability in Micromechanical Resonators" (Hsu et al.) in view of Publication titled "Micromachining Technologies for Miniaturized Communication Devices (Nguyen).

With regards to claims 3 and 5, Hsu et al. does not explicitly suggest a submicron lateral capacitive gap between the resonator and the electrodes. Nguyen discloses a resonator beam, as observed in Figure 9, a submicron gap between the resonator and the electrodes. It would have

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been obvious to a person of ordinary skill in the art at the time of invention to have readily recognize the advantages and desirability to implement the device of Hsu et al. to provide a submicron gap between the resonator and the electrodes as taught by Nguyen to reduce electrode series resistance. (See, page 29, last paragraph of Nguyen).

With regards to claim 19, it would have been obvious to an artisan to use the device as a temperature sensor since this is a mere design expedient to the manufacturer and since, as disclosed on page 948 of Hsu et al., the device can be used in watches or wireless transceivers, meaning that the device can be used in other preferred embodiments without departing from the scope of the invention.

With regards to claim 24, it would have been obvious to a person of ordinary skill in the art to have readily recognize the advantages and desirability of fabricating the first and second support members of the support structure wider than the resonator to prevent the support structure from vibrating during operation since one would normally realize in order to prevent the support structure from vibratory movement, one needs to make these support members more rigid and stronger by making its dimensions larger in width or length or by adding mass/weight to the support structure than the resonator so that when the resonator vibrates and/or bends at a certain direction (the x-direction or the y-direction), the support structure is not affected and will not vibrate and/or bend at that particular direction due to its larger dimensions and weight.

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*Response to Amendment*

5. Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen Kwok whose telephone number is (703) 308-8149.

May 7, 2003

HELEN KWOK  
PRIMARY EXAMINER

